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THE TREATMENT OF FACIAL PARALYSIS, WITH
SPECIAL REGARD TO NERVE FRICTION

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FACIAL paralysis may be supranuclear, due to lesions in the cortex; nuclear, due to lesions of the actual nucleus; or infranuclear, from involvement of the nerve in its tortuous course within the pons, or through the wall of the skull, or just at its exit.

Now, the routine treatment of such cases by means of electricity in its various forms, supplemented by massage of the facial muscles, and in some cases combined with the administration of nerve tonics (*e.g.*, strychnine, etc.), is the one almost universally adopted by the medical profession. Nevertheless, there exists another form of treatment, *i.e.*, that of "nerve friction"¹ according to the method of Henrik Kellgren, which, in combination with certain other manipulations, is a most valuable therapeutic agent, sufficiently so to justify me in bringing it into prominent notice. All the more do I wish to give my experiences in view of the fact that although this method has been in existence for over forty years, and has been employed by those who practised it continually during the whole of this period, it appears to be almost unknown to the profession at large. On the other hand, however, it must be admitted that this is largely due to the meagreness of the literature on the subject; indeed, the only descriptions of nerve friction which aim at detailed information that have appeared in print are those by A. Kellgren² and the author.³

¹ Care must be taken not to confuse this name with that form of rubbing or massage of the skin also called "friction," but which is quite distinct from it.

² Stat. San.-Ber. d. K. K. Kriegsmarine für 1888, pp. 141-185, and "Technic of Ling's System," 1890.

³ "Elements of Kellgren's Manual Treatment," 1903, and Cyriax and Kellgren-Cyriax, *New York Med. Journ.*, 1910, 171.

P. H. Ling (1776–1839), the founder of the Swedish system of gymnastics called after him, was aware of the facts that a slight pressure on a nerve stimulates it, that a stronger one causes pain, that a still stronger one deadens the nerve, and that a very strong one damages it. Therapeutically he employed nerve pressures in order to stimulate nerves; owing to lack of records, it is now impossible to obtain precise details as to how or when he executed such pressures, or as to what results he achieved. After his death his theories were developed and his work carried on by his pupils and followers, and the employment of pressures on the facial nerve makes its appearance in the list of remedial agents.⁴ Neumann⁵ specifically mentions that such a pressure on the facial nerve should be maintained for from a few seconds to a quarter of a minute.

Such manipulation, however, did not prove so successful as had been hoped; it fell into discredit and finally almost into disuse. In Hartelius's handbook the only descriptions of nerve pressures are those referring to the arm and leg, and to these barely 20 lines are allotted; ⁶ facial nerve pressures ⁷ are referred to but not described. An attempt to revive nerve pressures in Sweden was made by Wide⁸ about twenty-five years ago, but his methods differed greatly from those of his predecessors, inasmuch as his so-called "nerve pressings" were, to quote his own words, "more a kind of muscle kneading, and should be replaced by it." No success attended his attempt.

The reason why these nerve pressures failed to produce the desired beneficial effect is, in my opinion, not difficult to find. It lay in the fact that the pressure employed was too great in amount and applied over too long a space of time. From the researches of Bastian and Vulpian,⁹ Waller,¹⁰ Luderitz,¹¹ Mitchell,¹² Francois-

⁴ Georgii, "Kinetic Jottings," 1880, p. 73, and the reports of cases in Blundell, "Medicina Mechanica," 1852.

⁵ Neumann, "Lehrbuch der Leibesübungen," 1856, part ii, p. 270.

⁶ "Lärobok i Sjukgymnastik," 1870, pp. 88, 89; 1892, pp. 88, 89.

⁷ *Ibidem*, 1870, p. 184; 1892, p. 185.

⁸ "Handbook of Medical and Orthopedic Gymnastics," 1903, p. 68.

⁹ *Gaz. méd.*, 1855, 794–795.

¹⁰ *Proc. Royal Soc.*, 1862, 89, and *Practitioner*, 1870, 321–326.

¹¹ *Zeit. f. klin. Med.*, 1872, ii, 97–120.

¹² "Injuries of the Nerves and their Consequences," 1872.

Franck,¹³ Grützner,¹⁴ Zederbaum,¹⁵ Efron,¹⁶ Goldscheider,¹⁷ Herzen,¹⁸ Jacoby,¹⁹ Ducceschi,²⁰ Calugareanu,²¹ Semenoff,²² Meek and Leaper,²³ and Joffé,²⁴ we know that a pressure, if applied quickly, stimulates a healthy nerve, but that if continued over any length of time, it diminishes its activity. It is quite reasonable to suppose that in diseased nerves (*i.e.*, those with diminished vitality) an even much briefer amount of continuous pressure applied daily at or about the same spot would be sufficient to further reduce their vitality. Moreover, any pressure, if not instantaneously removed, would cause venous and lymphatic stasis and temporary anæmia in and around the nerve, and so would still further aid in reducing its function by impairing the nutrition.

These considerations make it clear, however, why the old nerve pressures were actually employed for neuralgic and spasmodic affections of nerves, inasmuch as they diminished their excitability. Equally it explains why, as regards conditions of paralysis and anæsthesia, they were useless in the great majority of cases, indeed, sometimes only making matters worse.

It was during the latter part of the sixties that a new efficacious and rational method of direct manipulation of the nerve was evolved. Henrik Kellgren instinctively concluded that what was needed was a mechanical stimulation of nerve applied in such a manner that none of the detrimental results from continued pressure would arise; guided by this principle, he systematized a method of "nerve friction." At the same time he also elaborated various methods of nerve vibration. These manipulations have been employed by him and his pupils during the past forty years and more, and a large number of cases of facial paralysis have been successfully treated in this way.

¹³ *Compt. rend. Soc. de biol.*, 1880, 86-88, and *Gaz. méd. de Paris*, 1880, 164.

¹⁴ *Arch. f. d. ges. Phys.*, 1882, xxviii, 130-178.

¹⁵ *Arch. f. [Anat. u.] Phys.*, 1883, 161-189.

¹⁶ *Arch. f. d. ges. Phys.*, 1885, xxxvi, 467-517.

¹⁷ *Ibidem*, 1886, xxxix, 96-120.

¹⁸ *Ibidem*, 1886, xxxviii, 93-103.

¹⁹ *Journ. Nerv. and Ment. Dis.*, 1885.

²⁰ *Arch. f. d. ges. Phys.*, 1901, lxxxiii, 38-71.

²¹ *Journ. de phys. et path. norm.*, 1901, 393 and 413.

²² *Arch. f. d. ges. Phys.*, 1903, c, 182-189.

²³ *Amer. Journ. of Phys.*, 1910-11, xxvii, 308-322.

²⁴ *Arch. f. [Anat. u.] Phys.*, 1910, Suppl., 467, 468.

Technic of the Treatment.—This is essentially the same for all forms of facial paralysis, and consists of: (A) manual stimulation of the facial nerve; (B) active or resisted exercises for the paretic muscles; (C) stimulatory passive manipulations for the above muscles; to which must be added, but for peripheral paralysis only: (D) vibrations over the mastoid process.

General constitutional treatment should, of course, be employed whenever advisable; increased general vitality is a powerful factor in aiding the patient's recovery.

(A) *Manual stimulation of the facial nerve:* Before applying any forms of this, the nerve should be exactly located, either from knowledge of topographical anatomy, or, whenever possible, by the sense of touch, and the exact spot determined for applying the treatment. The operator then has the choice of one of the following forms of stimulation: (a) stationary frictions, *i.e.*, frictions applied continually at one spot; (b) running frictions; (c) energetic running vibrations; these are applied in series moving along the line of the nerve in its long axis; (d) a combination of b and c.

(a) *Stationary frictions:* The portion of the operator's hand which actually executes the friction is the back of the tip of the nail of either the first or second finger (supported by the thumb, if necessary) or the back of the tip of the nail of the thumb (supported by the finger, if needful). The joints of the digit should be slightly flexed. In rare cases, where there is great hyperæsthesia or from other causes, the operator may use the finger-tips of the approximated forefinger and thumb, and so execute the frictions partly with the nail and partly with the pulp of the digits.

Thereupon the digit (or digits) is moved across the nerve at right angles to its long axis, a slight amount of pressure being applied at the same time, and this is best effected by means of further flexion of the joint of the digit, not so much by movement of the hand and forearm *en masse*. It must here be insisted upon that it is of the utmost importance that the skin of the patient and the manipulating digit should move as one over the nerve, as otherwise merely a scratch of the skin results, the nerve being left absolutely unaffected. As soon as the nerve has been traversed, the pressure is released; then either a nerve friction is applied in the same manner, but in the reverse direction, thus arriving at the original position, or the nail is

merely passed lightly back to it. The manipulation is repeated several times, each individual friction occupying about a quarter of a second.

The spots where stationary frictions can conveniently be applied to the facial nerve are: (a) Behind the ascending ramus of the jaw about one inch above the angle (Fig. 1 shows this being done with the index-finger); (b) just in front of this point on the ascending ramus of the jaw for about half an inch of its course; (c) over the zygoma (as in Fig. 2). With regard to each of these three sites, the operator feels a distinct snap of the nerve as the finger-nail passes across it; the same can be felt and even sometimes heard by the patient. In all these sites the nerve lies against the bone, hence the facility of palpation. In the rest of the face the nerve mostly lies on soft structures and is therefore less easily stimulated by means of stationary frictions. (One caution is necessary: in aiming at the effect just described, Stenson's duct must not be mistaken for the facial nerve; the duct is indeed also palpable, but it lies farther forward and at a slightly higher level.) Stationary frictions can also be applied on the posterior auricular nerve, which can be felt as it passes over the anterior edge of the mastoid process.

As regards the frequency of a series of frictions, one per second is a slow rate, four per second a fast one; the actual rapidity is at the discretion of the operator; experience alone can dictate which speed is to be adopted. In practice it is not found good to continue for any length of time at any given spot; it is much better to execute a few frictions on one spot, then a few on another, and then to interpose, for example, an active exercise for the muscles of the face; by a judicious use of such alternations the amount of stimulation is never overdone.

(b) Running frictions: The tips of the approximated finger and thumb are placed in the position already described as an alternative for stationary frictions. The digits can then move either in unison with the skin over the underlying nerve, or, as the nerve lies so superficially, across the skin. The former method should be employed for frictions applied along one particular branch of the nerve, the latter when several branches are to be stimulated simultaneously. The finger and thumb, starting from the periphery of the nerve (forehead, nasal area, chin), move in a zigzag direction

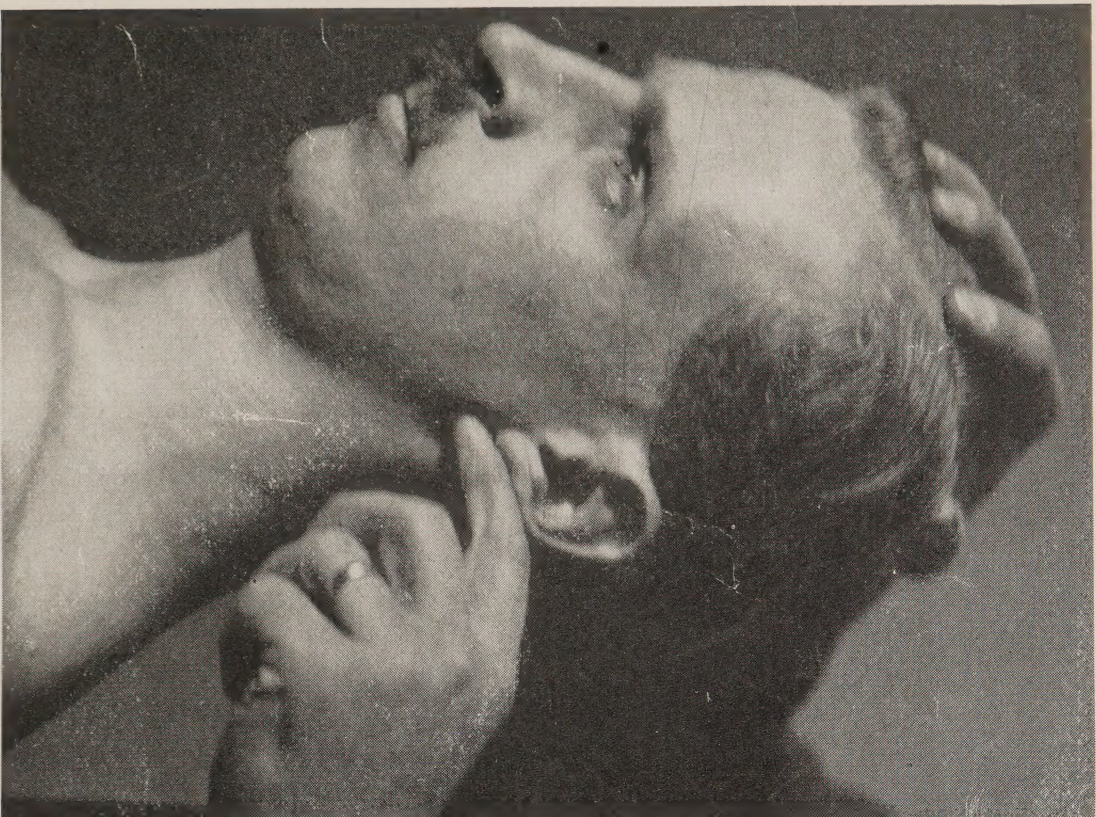
across the long axis of the nerve, the movement terminating at the point where the main trunk lies on the ascending ramus of the jaw. They can also be moved, starting from the occipital region, downward and forward to the anterior edge of the mastoid process, in order specially to stimulate the posterior auricular branch of the facial nerve. The more rapid the onward course of the manipulation, the less would the direction of each individual friction make of a right angle with the nerve; therefore in most cases it is best to retard the onward course to such a degree that each individual friction may traverse the axis almost at a perpendicular. Fig. 3 shows running frictions as applied over the temporofacial branches.

Exactly as in the case of stationary frictions, the amount of pressure exerted should be reduced to a minimum. And equally, when applying these running frictions over one branch of a nerve, the amount of pressure applied should be released after each individual friction. In the case of running frictions, unlike that of stationary frictions, the digits, as a rule, do not feel the distinct snap of the nerve as they traverse it, this being due to their rapid movement; the ultimate effect on the nerve seems, however, to be quite as beneficial.

The rate of execution of these running frictions should be two to four per second, and the rate of the onward movement about one or two inches per second. As in the case of stationary frictions, the running ones should not be applied for too long a time over any given area, but should alternate on different areas, or have a different kind of manipulation or exercise interposed.

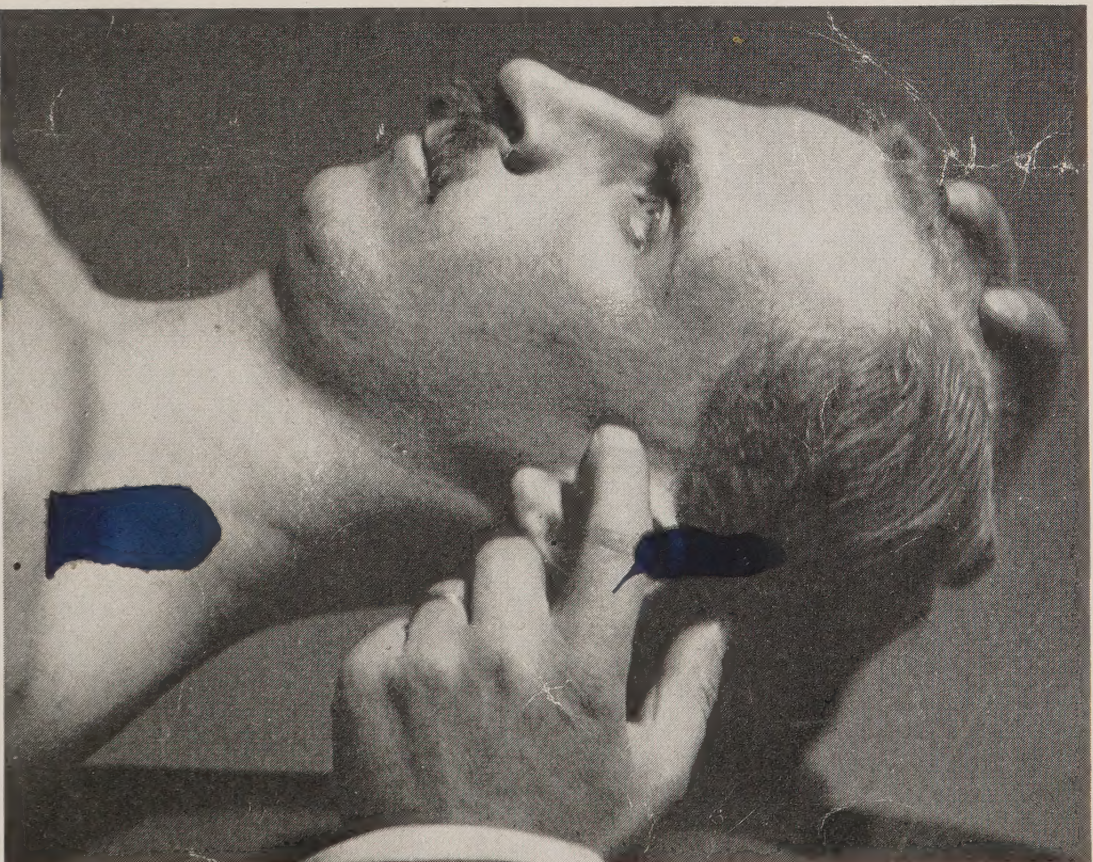
(c) Energetic running vibrations: It is necessary to emphasize the word "energetic," inasmuch as lightly applied running vibrations have only a soothing effect, and therefore would not have any stimulating effect upon the facial nerve. Either the tip of the approximated finger and thumb (as in the case of running frictions) or the back of the nails of two, three, or four fingers is used to apply the vibrations. The joints of the fingers, wrist, and elbow should be left as loose as is compatible with the correct execution of the movements, and the interphalangeal and the metacarpophalangeal joints should be slightly flexed. A rapid alternating contraction and relaxation of some of the muscles of the forearm, in whole or in part, is set up. The amount of muscular force exerted should be reduced to

FIG. 1.



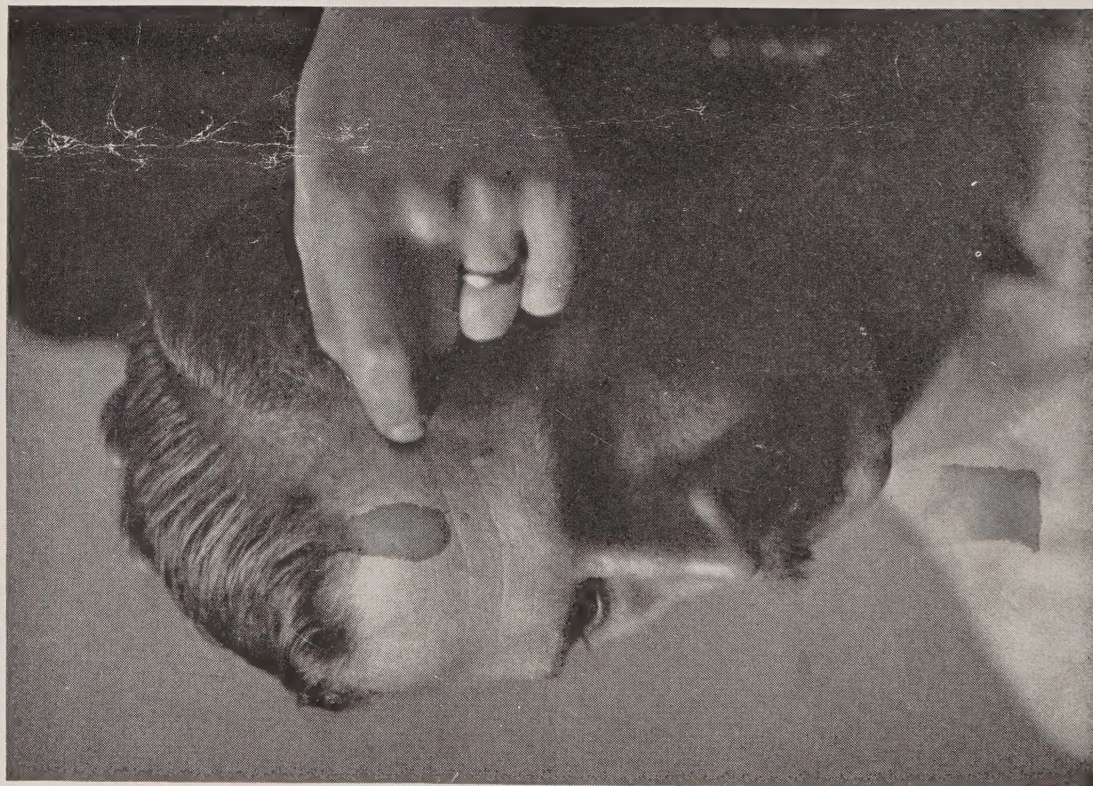
Frictions on the facial nerve behind the ascending ramus.

FIG. 2.



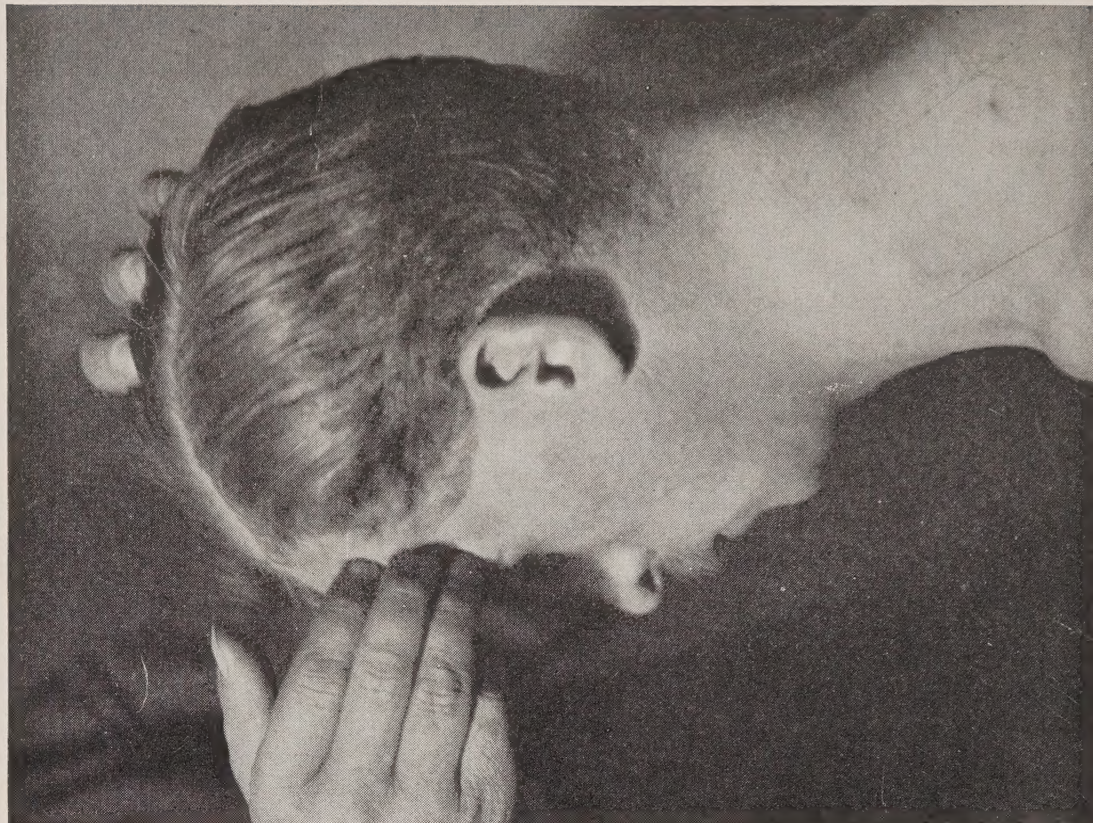
Frictions over the facial nerve in its course over the zygoma.

FIG. 3.



Running frictions over the temporofacial branches of the facial nerve.

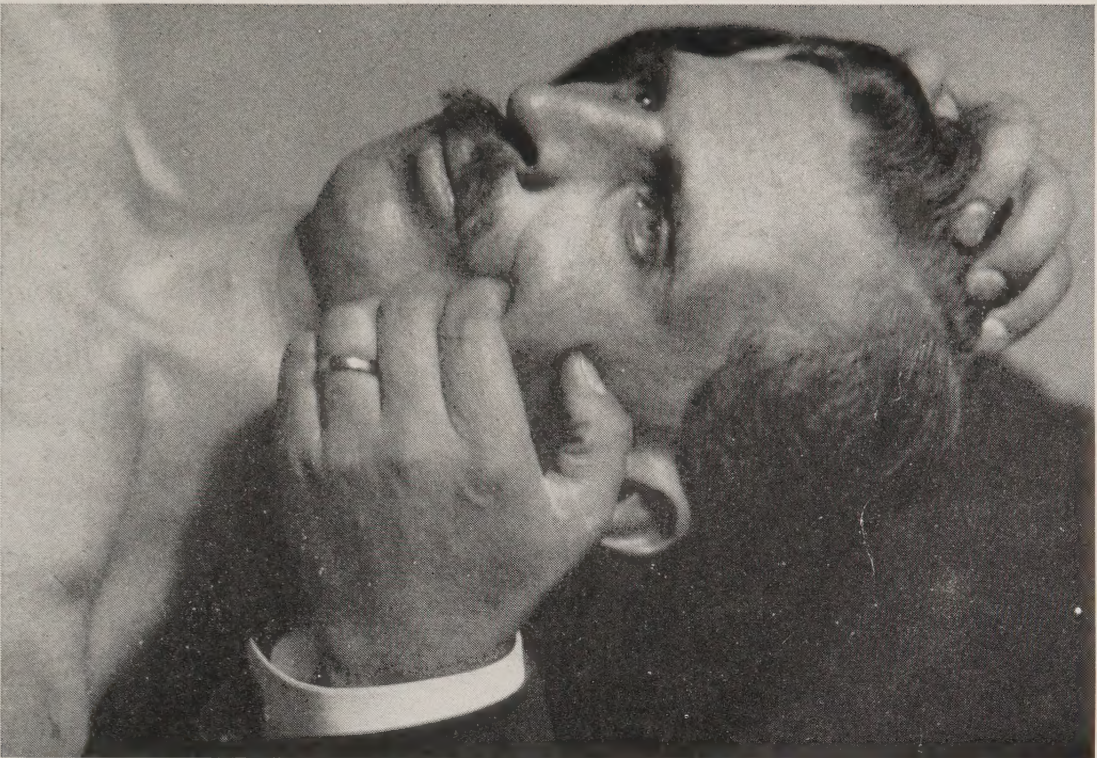
FIG. 4.



Running vibrations over the temporofacial part of the facial nerve.

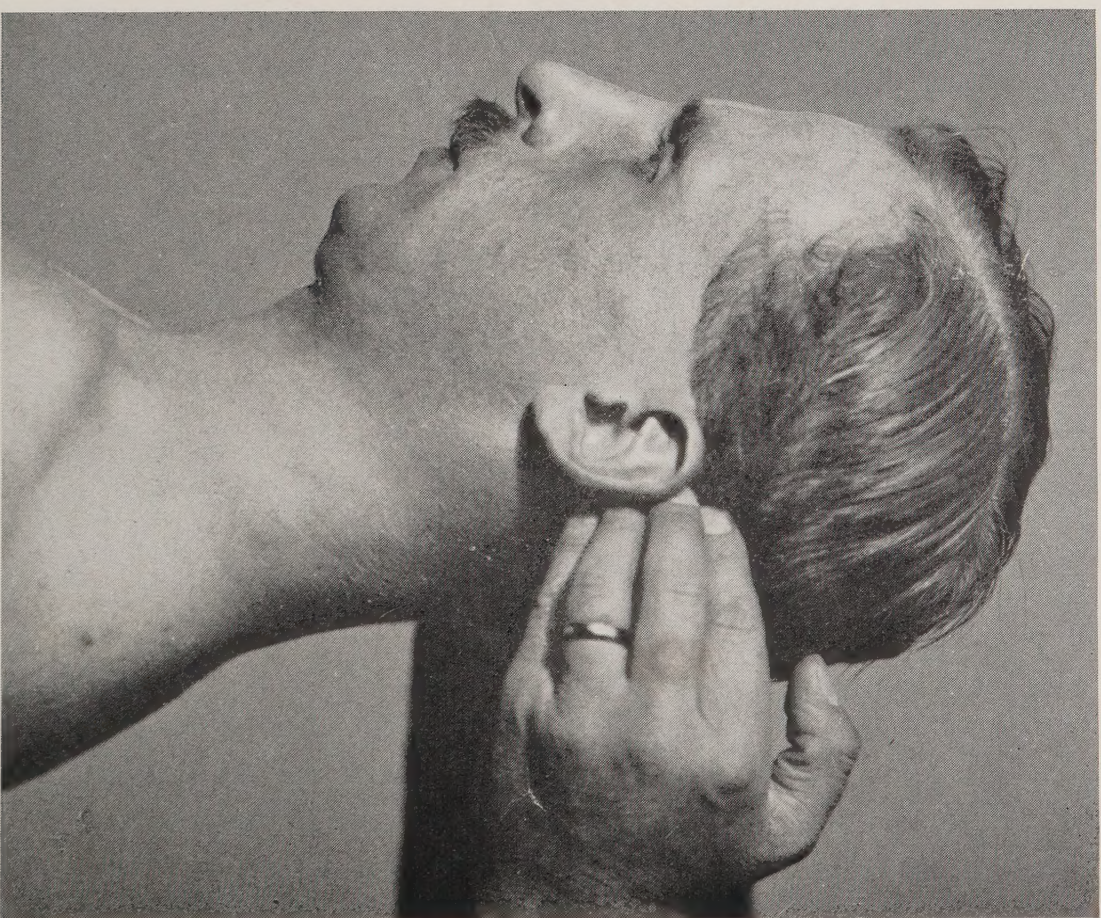
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FIG. 5.



Stimulatory manipulation for the zygomatic muscles.

FIG. 6.



Vibrations over the mastoid process.

such a degree that the active muscles are thrown not into complete but into incomplete tetanus. The speed of the actual vibration is from ten to twelve per second, that of the movement onward being about the same as in the case of running frictions. During the performance of the vibration, the finger-tips must remain in contact with the part of the body to be treated; they must not leave it. Were they to do so, the manipulation would resolve itself into a series of slight percussions like a rapid tapotement, and the manipulation greatly lose in effect. Fig. 4 shows running vibrations with the backs of the nails on the temporofacial branches.

On no account should vibrations be produced by means of powerful tetanus of the muscles of the arm and shoulder generally (a mistake which I regret to say is very common). If executed in this way, such a great amount of fatigue speedily ensues that it is impossible to maintain even and continuous vibrations for more than half a minute or so; in consequence the vibrations rapidly become irregular, jerky, unpleasant, and ineffective. Moreover, this method effectually excludes delicacy of perception and certainty of application.

As in the case of running nerve frictions, the digits never elicit the snap of the nerve as they pass over it.

(*d*) A combination of the last two methods may be adopted, *i.e.*, vibrations may be maintained by the hand during the time that the frictions are being executed. According to whichever is allowed to predominate, so may be used the defining phrases "running frictions with vibration" or "running vibrations with friction."

The manipulations described above produce the following effects:

(*a*) Major effects—changes in the length, shape, thickness, and anatomical position of the nerve, with rapid return to the normal. These changes will be of far greater amplitude in the case of frictions than in that of vibrations.

(*b*) Minor effects—torsional, transverse, and longitudinal vibrations in the nerve. Stationary frictions chiefly cause the torsional and transverse varieties; running frictions cause all three; and running vibrations chiefly the longitudinal kind.

The total resultant is mechanical stimulation of the nerve. The classical experiments of Tigerstedt²⁵ have demonstrated that a

²⁵ "Studien über mechanischen Nervenreiz," Helsingfors, 1880.

gentle stretching of a nerve causes stimulation, but a more powerful one the opposite effect. Langendorff²⁶ found that rapid alternative elongation and shortening of the sciatic nerves of frogs and mammals by means of tuning-forks caused them to be stimulated. Axenfeld²⁷ also used tuning-forks to excite nerves. Uexküll,²⁸ who experimented with his neurokinet, at first considered that it was the actual vibration that was the stimulant, but later on he concluded that this was erroneous, and that the stimulant was the alternate elongation and shortening, and in particular the abruptness of the movement. Many observers have before and since that time demonstrated that pressure applied *slowly* and continuously can entirely destroy the nerve function without causing any stimulation of it. Borutau,²⁹ using Uexküll's apparatus on the vagus, produced inspiratory tetanus. Oinuma³⁰ and Von Frey³¹ came in 1910 to the following conclusions: in order for mechanical nerve stimulation to be effective there must be not only the application of a force producing change in shape, but also the force must be applied as an impulse at a certain rate of speed. Alterations in the relative intensity and rapidity may to a certain extent compensate one another, but increase in the rapidity of the applied force is more efficacious as regards the result than increase in the force itself. It is therefore probable that a very slight change in shape will be sufficient to cause a stimulation if it can but be brought about with sufficient velocity. The amount of change of shape necessary to produce a stimulation is only a small percentage of the diameter of the nerve; the greater the amount, the greater the stimulation, but only up to a certain point, the maximum being attained with a change in shape amounting to some 20 to 50 per cent. of the diameter.

Some observers have also shown that excitation of a nerve causes conduction in both directions; currents of action are found both distally and proximally from the site of stimulation. This is true for motor as well as for sensory nerves. There seems to be no reason

²⁶ *Centrlbl. f. d. med. Wiss.*, 1882, xx, 113-115.

²⁷ *Centrlbl. f. Phys.*, 1892, vi, 299-300.

²⁸ *Zeitschr. f. Biol.*, 1894-95, xxxi, 148-167; 1895-6, xxxii, 438-445; 1899, xxxviii, 291-299.

²⁹ *Arch. f. d. ges. Phys.*, 1896-97, lxxv, 26-40.

³⁰ *Zeitschr. f. Biol.*, 1910, liii, 303-318.

³¹ *Sitz.-Ber. d. phys.-med. gesellsch. zu Würzburg*, 1910, 5-9.

for doubting that the facial nerve is in this respect like every other nerve, and so it is safe to conclude that the mechanical stimulation of the nerve as I have above described it acts not only peripherally but also centrally, thus tending to stimulate it in its entire length.

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The commonest mistakes made by beginners in administering nerve frictions are, first, that the finger applies a great amount of pressure before the friction is executed; and, secondly, that the actual friction is executed by slowly passing the finger across the nerve. This is exactly the reverse of what should be done, as, from the physiological data cited, it can be clearly seen that the nerve tends to become paralyzed in consequence of such a degree of pressure being applied; and that if too slowly applied, the manipulations fail to cause any stimulation of the nerve. As regards the amount of pressure employed, I have endeavored to ascertain in myself what the minimum amount would be; as nearly as can be estimated, a pressure equivalent to one ounce (28 grams) as the finger-nail passes over the nerve as it lies behind the ascending ramus of the jaw (as in Fig. 1) is sufficient for the distinct snap of the nerve to be felt and to induce a mild feeling of stimulation. I would also state, *en passant*, that a friction applied erroneously in the slow and heavy manner just described causes quite a different kind of sensation on the part of the patient; instead of a stimulatory feeling he will experience a dull, heavy ache of an unpleasant character.

(B) *Active or resisted exercises for the paretic muscles:* As regards active exercises, the patient should himself endeavor to restore those movements which he has lost in consequence of the paralysis. Such endeavors are conveniently made and the movements practised in front of a looking-glass. As the power of movement returns resistance can be applied, although as a general rule even in normal subjects the facial muscles have but little power of acting against resistance.

Let me for the sake of illustration presume that one has a case under treatment where no active contraction in any of the facial muscles results, even from the most strenuous voluntary efforts on the part of the patient. Such a condition does not, however, imply necessarily that the muscles are totally paralyzed. If the operator performs passively the movement of which the paralyzed muscles are incapable, it may be found that the patient can maintain his muscles

in the new position, even if only for a fraction of a second, *i.e.*, a shortening passively induced can be actively maintained. For example, the patient may not be able actively to contract the frontalis muscle, thereby wrinkling the forehead; if, however, the forehead is passively wrinkled by the operator, the patient may be able to keep it wrinkled after the operator has let go. Indeed, it is sometimes found that the patient can appreciably resist the efforts of the operator to elongate the muscles in question, even when no purely active contraction can be effected by the patient's unaided efforts. (Such movements are known gymnastically as *excentric* resisted movements, in opposition to the *concentric* ones during which the patient shortens his muscle against resistance.) It is also a matter of experience that in some cases where none of the above signs of muscular activity can as yet be elicited, attempts to perform the movements are followed by a feeling of fatigue in the muscles involved; this is one of the first signs of return of muscular activity.

(C) *Stimulating manipulations for the muscles:* Nearly all books recommend facial massage for cases of atrophic facial paralysis. On consideration, however, it rapidly becomes evident that as the paralysis is primarily in the nerve and not in the muscles, the more any massage manipulation lets the nerve alone, the less will be the resulting benefit. The usual kind of facial massage employed, in which the tips of the fingers are rubbed over the skin of the cheek, is, in my opinion, a sheer waste of time. The more energetic varieties, performed with one finger inside the cheek, whereby the facial muscles are submitted to *pétrissage* proper, are more efficacious, but it would appear only inasmuch as they stimulate the terminal fibres of the facial nerve. Palmen and Rancken's³² researches show that energetic massage acts partly by stimulating the cells of the parts and partly by bringing about alterations in the excitability of the nerves and their terminal fibres, thereby inducing changes in the discharge from the brain and spinal cord. But the stimulation of the cells of the part cannot be more than transient if the corresponding nerves are paralyzed; thus in cases of facial paralysis massage of the face muscles can only take effect in proportion as the facial nerve is stimulated and is recovering. Therefore it is much better to stimulate the nerve directly by means of nerve friction.

³² *Skand. Arch. f. Phys.*, 1909, xxi, 383-404; also Rancken, *Tidskr. i Gymn.*, 1911, xxxviii, 237-273.

6 figs = 2 pp.

The only kind of stimulatory manipulation that is of any benefit to the facial muscles is one in which the operator places the muscles in the position they would occupy if able to contract, and then relaxing a little brings them by a sharp movement back to the contracted position. This is effected by placing the thumb at one end of a muscle or group of muscles, and two or more of the fingers (according to the size of the area treated) at the other end. By sharply approximating the thumb and fingers the muscle in question is shortened and receives a kind of jerk. This may be repeated a few times before the patient performs an active movement in order to prepare the muscle about to be involved, at the same time stimulating it together with its nerve. Fig. 5 shows the manipulation being applied to the zygomatic muscles.

Frictions applied like stationary nerve frictions, at right angles across any particular muscle, cannot be regarded so much as a stimulant for the muscle as for its nerves of supply, as also for the terminal branches of the fifth nerve. Certain observers have found that destruction of the sensory nerves of the face caused a certain amount of facial paralysis, but stimulation of the fifth nerve does not seem to have any ameliorating influence on paralysis of the facial nerve, and personally I do not employ such nerve stimulation with this object in view.

(D) *Vibrations over the mastoid process, i.e., over the facial nerve in its passage through the bony canal:* The method of executing these vibrations has already been described under the head of running nerve vibrations. The operator, standing either in front of or behind the patient, places the tips of the fingers (held in the same straight line, and in this case vertically) over the mastoid process (or less commonly just in front of the meatus). Vibrations are then set up; that they penetrate the middle ear is evident, as they may be quite easily felt by a third person whose hand is placed meanwhile against the opposite side of the patient's head. The tendency of these vibrations is to dispel the inflammatory material which is produced by the neuritis and which is causing compression of the nerve where the latter lies in the bony canal. Local congestion will also tend to be removed. Fig. 6 shows the vibrations being applied by the operator, who stands behind the patient.

The length of time spent on each of the movements described

should be approximately as follows, but individualization is, of course, of the greatest importance:

Passive nerve stimulation (frictions and energetic vibrations): five to ten minutes, never dwelling for any length of time, however, at one spot.

Active exercise: This is the most difficult group for which to specify anything definite; it is better to practise often and little at a time than the reverse.

Stimulatory manipulation for a muscle or a group of muscles: a few seconds to a minute.

Vibrations over the mastoid: five to ten minutes.

The above treatment should be undergone daily; in very severe cases it may be of advantage to apply the passive nerve stimulation twice a day to commence with. As regards the active efforts of the patient to perform the various facial movements, these can with advantage be repeated two or three times a day, or even oftener, always taking care that no particular movement is practised too long, as fatigue so easily occurs.

The immediate and remote results of the treatment may be considered as follows:

(a) Immediate: In normal subjects a series of consecutive frictions on the facial nerve (sometimes even one is sufficient) causes a peculiar radiating sensation in the cheek and face generally; in some cases similar sensations may result in the pharynx and ear. Actual contraction of the facial muscles, however, hardly ever results even from repeated energetic frictions on the facial nerve. In case of facial paralysis these phenomena are not quite the same. The amount of sensation induced by the friction may be increased and to by no means an inconsiderable extent. Sometimes such nerve frictions may set up a tonic contraction of the muscles of the face in whole or in part; this contraction is sometimes a little unpleasant and may persist from a few seconds to half a minute after the cessation of the frictions. Sometimes after their cessation a feeling of stiffness may be experienced in certain areas of the face which are quite paralyzed; this is a good sign, and as a rule immediately precedes return of movement in those areas. This is analogous to the similar sensations experienced when the patient endeavors to perform active movements, as mentioned above.

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(b) Remote: Up to the present I have not met with a case of facial paralysis that I have been unable at any rate to benefit. Even cases that had lasted for as much as two years with but little improvement have improved under the nerve friction treatment so much that finally no deformity was visible when the face was left still; in some cases, indeed, I have been able to effect a complete cure. The worst case of facial paralysis I ever had to deal with, and, as can be seen from the description, even here a certain amount of improvement resulted, was as follows:

Miss X, aged fourteen, fell through a skylight a vertical distance of some 20 feet, alighting on her head, and she sustained a fracture of the base of the skull. Immediately after the accident the patient was able to speak a little, and several witnesses testified that there was no facial paralysis. After about twenty minutes, however, it set in and was complete very soon afterward. Patient had great hemorrhage through the nose and mouth and her life was despaired of. She recovered slowly, however, and three weeks after the accident was so much better that electrical treatment for the face was prescribed. Complete reaction of degeneration was present by this time. The battery was employed, generally twice daily, with a little massage at intervals, over an uninterrupted period of two years and three months. After about two months the method of applying the electrical treatment was entrusted to a relative of the patient; in her zeal, however, the relative increased the strength of the current, thinking thereby (in spite of instructions) that more benefit would be derived, and for two years or more the apparatus was being employed to its full strength. In July, 1900, when I saw the patient for the first time, there was the most complete and typical facial paralysis I have ever seen; there was not a vestige of voluntary movement or tone in any of the facial muscles. Hearing was practically normal; there was complete reaction of degeneration.

The manual nerve stimulatory treatment was commenced on July 7, 1900, the electrical treatment being stopped altogether. The contour of the face showed signs of improvement, and in less than four weeks' time there was slight voluntary movement of the muscles at the side of the nose. Improvement continued slowly until February, 1901, when the patient contracted diphtheria and nearly died in consequence; a peripheral neuritis set in, which chiefly affected the anterior tibial nerves, but also the facial nerve, and the condition got worse again. The ground lost, however, was slowly regained, and in the course of the same year most of the muscles of the face had recovered their movements, though not to their full extent. When the face was at rest, it was very difficult to see on which side the deformity was. From January, 1902, onward nothing was done and the condition remained about the same. In April, 1902, nerve anastomosis with the spinal accessory nerve was performed, with no good result, however. Complete paralysis of the face again set in and has persisted ever since, the only result being that on elevation of the shoulder an involuntary contraction of the risorius results; it cannot, however, be contracted voluntarily.

The length of time necessary to effect a cure is to a great extent influenced by the treatment, especially that by electricity, of whatever

kind, and nerve stimulants, such as strychnine. The following holds good: Cases that have improved under the latter methods almost invariably improve far more quickly when the manual nerve treatment is used, not as an addition but as a substitute. Cases that have remained entirely refractory to the former methods usually undergo amelioration with the latter, generally with a difficulty more directly proportionate to the length of the previous treatment than to the time the disease has lasted. By far the most favorable cases are those in which no previous treatment has been undergone, and this holds good even with those of comparatively long standing. I have also noticed that patients who were compelled to discontinue the manual nerve treatment under me, and who have continued with electrical treatment, have improved at a far slower rate than when under my care; in one case, indeed, the improvement not only stopped under the latter method, but the condition even got worse. In one case where, unknown to me, the patient also continued the electrical treatment while coming to me for the manual nerve stimulation, the rate of improvement increased as soon as the administration of electricity was discontinued. The previous administration of facial massage has no effect in modifying the prognosis so far as I am aware.

Before passing on to notes of illustrative cases, I can but give it as my opinion that nerve frictions can effect far more in cases of facial paralysis than the ordinary methods of electricity and drugs, and I can only urge the medical profession to substitute it without hesitation for the ordinary methods, not merely to resort to it as a last hope after all else has failed. I must, however, point out that the actual treatment must either be carried on by the medical man himself or by some one who has received the special training necessary for it. Ordinary masseuses are not to be entrusted with them, inasmuch as the treatment I have described is not a routine one; it needs long experience to acquire and discrimination and judgment in order to know how to modify the treatment from day to day and week by week in order to meet the physiological requirements of the case and its continual alterations.

CASE REPORTS

CASE I.—Mrs. X, aged thirty, was out motoring on October 23, 1910, and caught cold; the following day complete paralysis set in on the right side of the face; hearing unimpaired, but there was loss of taste. The diagnosis of

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peripheral facial paralysis was made, and the faradic current was employed twice daily for fourteen days, after which galvanism was chiefly had recourse to. During the ensuing five weeks hardly any improvement resulted, otherwise than that the sense of taste returned. On November 27 Dr. Howell Evans, of London, was consulted, and sent the case to me for manual nerve stimulation.

I first saw the patient on November 28. The ordinary signs of facial paralysis were present on the right side of the face. There was no voluntary movement anywhere in that area; patient could not close her eye; food collected in the cheek and saliva was running out of the corner of the mouth, etc. There was, however, no reaction of degeneration. Immediately after the first nerve friction treatment the patient found herself able again to contract slightly the zygomaticus, to dilate the nostril and pull back the corners of the mouth. On November 30 the power of elevating the eyebrow returned to a slight degree. December 1 the whole contour of the face was better; closure of eye commenced; a good deal of stiffness was felt in the face from this day onward. December 2 cramp in the muscles around the mouth was induced by nerve friction. December 7 patient could quite close the eye for the first time since the commencement of the paralysis. January 7, 1911, steady daily improvement; patient again able to whistle to-day for the first time. March 8, patient practically cured; no deformity visible even when smiling, only on laughing heartily. All the movements on the right side fully established, though not quite so powerful as on the left side. At this date patient unfortunately had to stop the treatment. Owing to various circumstances, the patient had not always been able to undergo the treatment regularly, having actually received 58 séances during ninety-four days.

CASE II.—This was the case of a medical man, Dr. Campbell Ross, who has kindly allowed me to publish his case, and who has favored me with his own notes on it. In consequence of the patient reading for an examination, the treatment had to occupy as little time as possible; the manipulations employed were exclusively nerve friction. Thus the results of the case rest on the merits of this one form of treatment alone. His notes are as follows: "In September, 1902, being up for an examination at the time and rather run down, I caught cold sitting beside an open window; an attack of facial paralysis supervened on the right side. It presented all the usual symptoms; no voluntary movement at all was present, the angle of the mouth could not be moved up and down, the lips could not be pursed up, the forehead could not be wrinkled, the eye could not be completely closed, etc. The buccinator was involved and food collected between the cheek and gum and occasionally was extruded at the angle of the mouth. Taste was lost on the right side of the tongue and sensation was diminished; the affected area of the tongue was white and coated, the rest being clean. The tongue was not deflected and the uvula and palate were not involved. Pain was present over the mastoid for a day or two, and for this blisters were applied in front of and behind the ear. The pain disappeared in a day or two, and electrical treatment was resorted to. There was no response to faradism, and the galvanic response was very sluggish; the reaction of degeneration was fully established after three weeks.

"There was no return of voluntary movement until the end of December, 1902, when slight contraction of the zygomaticus was noticed; it slowly improved, and in January, 1903, the eye muscles exhibited a little activity. About the middle of January, 1903, the galvanic electricity was given up and high-

frequency currents substituted. In March, 1903, slight movement commenced in the muscles of the forehead. At the end of that month, however, the muscles were commencing to contract and the histrionic spasm was present. This was aggravated both by electricity and attempts at massage, and in consequence the electrical treatment was stopped. At this time there was no response to faradism.

"From then until January, 1907, no treatment was resorted to. Improvement took place very slowly indeed, so that at that time the condition was as follows: the eye could be closed, but ptosis was present; the forehead could be slightly wrinkled; the corner of the mouth could be drawn up, but when doing so the eye closed, and *vice versa*. The buccinator now prevented food accumulating in the cheek. There was no movement at all in the muscles of the nose, nor in the depressors of the angle of the mouth, the levator menti, and there was no nasolabial fold. Taste and sensation had returned; a good deal of epiphora was present, which was much benefited by having the lachrymal duct syringed out. In February, 1907, I happened to be applying electrical treatment to a patient, and I tried it on myself; I found that I could get faradic response in almost all the muscles."

Patient consulted me on April 16, 1907, and I found the face in practically the same condition as described by himself in January, 1907. I treated him twenty-nine times between April 17 and May 22; marked improvement resulted, so that on the latter date the condition was as follows (I again quote from the patient's own notes): "All the movements of the face were much improved; coördination was better, so that I could smile without movement of the eye and *vice versa*. In addition, voluntary movement had returned to the muscles of the nose, depressors of the angle of the mouth, and the levator menti. Ptosis hardly present any more and no longer epiphora unless after prolonged exposure to cold wind. Nasolabial fold has returned."

Unfortunately the treatment had to be discontinued in consequence of the patient leaving town, but I am convinced that further improvement would have resulted. The last report from the patient, dated November 15, 1911, is as follows: "The movements of the right side have continued to improve, especially as regards the tone of the muscles. Cold winds do not affect the face so much as formerly. Ptosis is gone and there has been no epiphora lately."

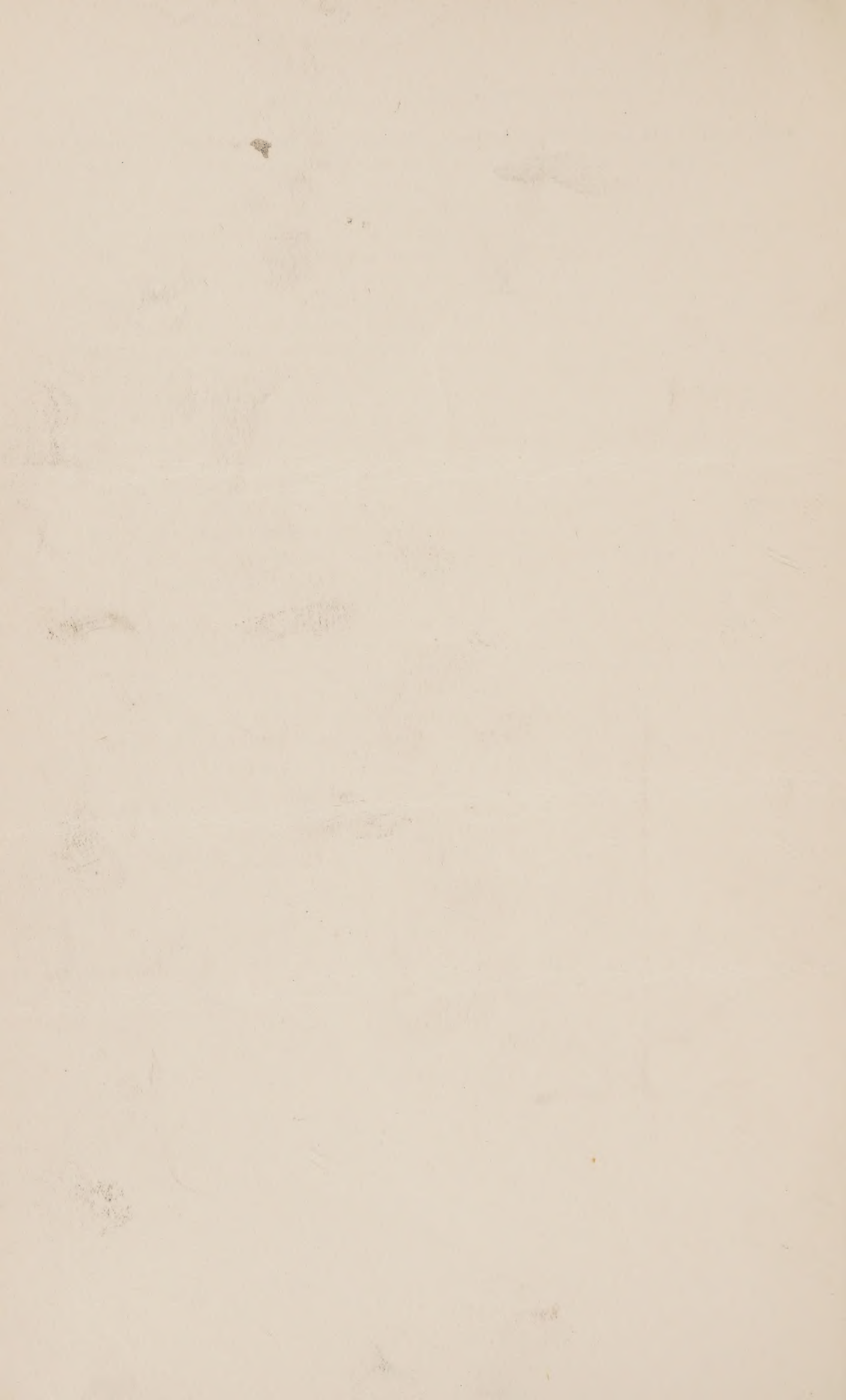
CASE III.—Mr. H., aged forty-eight, who has had glycosuria for the last thirty years, had been suffering from business worries, had also been house-hunting, and was in a very nervous state. On July 20, 1898, he suddenly noticed difficulty in whistling; on the 21st he had right-sided facial paralysis. I first saw the patient on July 22; there was complete paralysis of the right half of the face, no voluntary movement possible; liquids ran out of the corner of his mouth, etc. "Taste and hearing were normal, no deviation of the palate. July 23, contour of face better. July 24, slight return of movement at the angle of the mouth. On July 27 movement of the orbicularis oris returned. Steady improvement continued until August 22, when the patient was practically entirely cured, but at his own request he received four more treatments between that date and September 5. His face has remained well ever since.

CASE IV.—G. A., aged seven, an undersized boy, suffering from congenital heart disease, inguinal hernia, and undescended testicle, caught cold on August 10, 1898; on August 11 complete right-sided facial paralysis set in. The face was

smooth, the right eye open, considerable lachrymation. No voluntary movement possible in any part of the right side; taste and hearing were normal. August 11, manual nerve treatment commenced. August 20, patient could smile a little on his left side; August 22, the occipitofrontalis could be wrinkled. Power of all movements gradually returned, and on September 10 everything was normal with the exception that the eye could not yet be closed properly. Circumstances then rendered it necessary to suspend the treatment until October 6, when it was resumed by my colleague, Dr. A. Möller, who cured the remaining weakness in three weeks. The face has remained quite well ever since.

CASE V.—H. A., female, aged thirty-nine, had suffered from heart disease since 1876; after influenza, in March, 1899, there resulted an embolus into the internal capsule, resulting in complete paralysis of the left side of the body (face, arm, and leg), with transient aphasia lasting twenty-four hours. I first saw the patient in May, 1900; she showed all the symptoms of left-sided hemiplegia, which I need not describe in detail, except as regards the facial nerve. There was still partial paralysis of the left side of the face, which latter had not the same contour as the right side; movements had returned in all the muscles, but were not so strong as on the right side. When not smiling, the corner of the mouth was pulled a little over to the other side and was constantly a little dropped, there were fewer wrinkles on the forehead, only very slight wrinkling of the nose was possible. When smiling, the left side of the mouth remained stationary. Saliva did not run out of the corner of the mouth. After seven days' treatment of re-education exercises, general nerve stimulation for the leg and arm, and local facial treatment such as I have described, the facial paralysis had quite disappeared; it was impossible to tell on which side it had been originally, and the condition remained well until 1905, when I lost sight of the patient. I may here state that the condition of the arm and leg improved only very slowly as compared with the face.

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